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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
FEDOWITZ, MATTHEW L	
ART UNIT	**PAPER NUMBER**
1623	

DATE MAILED: 10/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/735,335	MADHAVI ET AL.	
	Examiner	Art Unit	
	Matthew L. Fedowitz	1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Information Disclosure Statement

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1) Determining the scope and contents of the prior art.
2) Ascertaining the differences between the prior art and the claims at issue.
3) Resolving the level of ordinary skill in the pertinent art.
4) Considering objective evidence present in the application indicating obviousness or nonobviousness.

A. Claims 1-10, are rejected under 35 U.S.C. § 103(a) as being unpatentable over Leuenberger *et al.* (US 5,221,735), Fukamachi *et al.* (US 4,929,774), Patel *et al.* (US 6,569,463) and Orthoefer (US 4,125,630).

1. Claims 1, 2 and 3 are directed to a formulation of a bioavailable freeze-dried cyclodextrin/carotenoid complex, in a molar range from 0.5:1 to 10:1, and vegetable oil. The formulation also directs that the vegetable oil be edible and consist of one or more of coconut oil, corn oil, cottonseed oil, oat oil, olive oil, palm oil, palm kernel oil, peanut oil, rapeseed oil, rice bran oil, safflower oil, sesame seed oil, soybean oil, or sunflower oil.

Leuenberger *et al.* teach a bioavailable (see column 1 lines 5-18) spray-dried (see column 3 lines 43-44 through column 4 lines 1-3) cyclodextrin/carotenoid complex (see column 1 lines 5-18 and lines 44-48), as well as their formulation ranges (see column 3 example 1 and column 4 examples 2 and 3) and oil (see column 1 lines 18-32). Leuenberger *et al.* does not teach freeze-drying of the cyclodextrin/carotenoid complex, the use of another carotenoid other than lycopene and apocarotenol in creating a formulation. Nor does Leuenberger *et al.* teach the use of a specific type of oil or the use of an edible oil much less the use of one or more of coconut oil, corn oil, cottonseed oil, oat oil, olive oil, palm oil, palm kernel oil, peanut oil, rapeseed oil, rice bran oil, safflower oil, sesame seed oil, soybean oil, or sunflower oil. Fukamachi *et al.* does teach a technique of freeze-drying of formulations (see column 3 lines 26-31) and the use of lutein and zeaxanthin in formulations (see column 3 line 57). Fukamachi *et al.* also teaches the use of edible vegetable oils such as olive oil, soybean oil, corn oil, cottonseed oil, sunflower oil, peanut oil, palm oil, and coconut oil (see column 2 lines 11-20) and Orthoefer teaches edible triglyceride vegetable oils such as cottonseed oil, soybean oil, coconut oil, rapeseed oil, peanut oil, olive oil, palm oil, palm kernel oil, sunflower seed oil, rice bran oil, corn oil, sesame seed oil, safflower oil and the like (see column 4 lines 37-49).

Therefore, it would have been obvious to one having ordinary skill in this art at the time the invention was made to prepare a formulation of a bioavailable freeze-dried cyclodextrin/carotenoid complex, in molar ranges of 0.5:1 and 10:1,

and vegetable oil. Where the formulation also directs that the vegetable oil be edible and consist of one or more of coconut oil, corn oil, cottonseed oil, oat oil, olive oil, palm oil, palm kernel oil, peanut oil, rapeseed oil, rice bran oil, safflower oil, sesame seed oil, soybean oil, or sunflower oil having the above cited references before him. By considering all the prior art cited it would lead one skilled in the art to have a reasonable expectation of success in combining Leuenberger *et al.* with Fukamachi *et al.* and Orthoefer to obtain a bioavailable freeze-dried cyclodextrin/carotenoid complex formulated with a vegetable oil.

Leuenberger *et al.* provides the motivation to produce a "bioavailable carotenoid-cyclodextrin formulation for soft-gels and other encapsulation systems" because carotenoids are generally insoluble in polar solvents such as water. And when carotenoids are complexed with cyclodextrin this allows for solubility in polar solvents and increased bioavailability (see US 5,221,735 column 1 lines 6-17).

2. Claim 4 is directed to a formulation depending from claim 1 (as considered above) wherein the weight-to-weight ratio of lecithin to vegetable oil is 10:1 to 1:1.

The teachings of Leuenberger *et al.* and Fukamachi *et al.* are discussed above. Leuenberger *et al.* and Fukamachi *et al.* do not teach a formulation using a surfactant. Patel *et al.* does teach the use of a surfactant such as lecithin (see claims 1, 11 and 12).

Therefore, it would have been obvious to one having ordinary skill in this art at the time the invention was made to prepare a formulation of a freeze-dried bioavailable cyclodextrin/carotenoid complex and vegetable oil with lecithin in a lecithin to vegetable oil range from 10:1 to 1:1 having the above cited references before him. By considering the teaching of Leuenberger *et al.* and Fukamachi *et al.* above as well as the teaching of Patel *et al.* regarding the use of and effective solubilizing amount of lecithin would lead one skilled in the art to have a reasonable expectation of success in combining Leuenberger *et al.* with Fukamachi *et al.* and Patel *et al.* to obtain a bioavailable freeze-dried cyclodextrin/carotenoid complex formulated with lecithin to inhibit the release of active ingredients or modulate the dissolution properties of the formulation.

Patel *et al.* provides the motivation to produce a "bioavailable carotenoid-cyclodextrin formulation for soft-gels and other encapsulation systems" that makes use of lecithin because formulations utilizing such materials can be used for improved delivery of pharmaceutical active ingredients (see US 6,569,463 abstract).

3. Claims 5, 7, 8 and 10 are directed to a formulation depending from claim 1 (as considered above) wherein the cyclodextrin derivatives consists of α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin or hydroxypropyl-β-cyclodextrin; the carotenoid consists of lycopene, lutein, or zeaxanthin; the lecithin to vegetable oil

ratio of the formulation is between 10:1 and 1:1 and the resulting final formulation is disposed in soft gelatin capsules.

The teachings of Leuenberger *et al.* and Fukamachi *et al.* are discussed above. Patel *et al.* teach the use of cyclodextrin derivatives (see column 29 lines 29-30); the use of carotenes (see column 5 lines 15, column 6 line 37, column 53 line 24, column 54 line 6, column 58 lines 3 and 53 and column 59 line 27) particularly the use of lycopene and lutein (see column 5 lines 32-33, column 6 line 50, column 53 lines 42-43 column 54 lines 22 and 62, column 58 lines 21-22 and column 59 lines 1 and 40); the lecithin to vegetable oil ratios as considered above and the resulting final formulation disposed of in soft gelatin capsules (see column 33 lines 53-54). Patel *et al.* does not teach the specific use of α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin or hydroxypropyl-β-cyclodextrin or the use of zeaxanthin. Leuenberger *et al.*, however, does teach the use of α-cyclodextrin, β-cyclodextrin or hydroxypropyl-β-cyclodextrin (see column 2 lines 7-16). In addition, Fukamachi *et al.* teach the use of carotenoids such as lutein and zeaxanthin (see column 3 lines 56-57).

Therefore, it would have been obvious to one having ordinary skill in this art at the time the invention was made to prepare a formulation depending from claim 1 wherein the cyclodextrin derivatives consists of α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin or hydroxypropyl-β-cyclodextrin; the carotenoid consists of lycopene, lutein, or zeaxanthin; the lecithin to vegetable oil ratio of the formulation is between 10:1 and 1:1 and the resulting final formulation is

disposed in soft gelatin capsules having the above cited references before him. By considering all the prior art cited it would lead one skilled in the art to have a reasonable expectation of success in combining Patel *et al.* with Leuenberger *et al.* or Fukamachi *et al.* to obtain a bioavailable freeze-dried cyclodextrin/ carotenoid complex formulated with lecithin to be disposed of within soft gelatin capsules.

Patel *et al.* provides the motivation to produce a "bioavailable carotenoid-cyclodextrin formulation for soft-gels and other encapsulation systems" because formulations utilizing such materials can be used for improved delivery of pharmaceutical active ingredients that have hydrophilic or hydrophobic properties (see US 6,569,463 abstract).

4. Claim 6 is directed to a formulation depending from claim 1 (as considered above) wherein the carotenoid consists of lycopene, lutein, or zeaxanthin.

The teachings of Leuenberger *et al.* and Fukamachi *et al.* are discussed above. Patel *et al.* teach the use of carotenes (see column 5 lines 15, column 6 line 37, column 53 line 24, column 54 line 6, column 58 lines 3 and 53 and column 59 line 27) particularly the use of lycopene and lutein (see column 5 lines 32-33, column 6 line 50, column 53 lines 42-43 column 54 lines 22 and 62, column 58 lines 21-22 and column 59 lines 1 and 40). Patel *et al.* does not teach the use of

zeaxanthin. However, Fukamachi *et al.* teach the use of carotenoids such as lutein and zeaxanthin (see column 3 lines 56-57).

Therefore, it would have been obvious to one having ordinary skill in this art at the time the invention was made to prepare a formulation containing carotenoids consisting of lycopene, lutein, or zeaxanthin having the above-cited references before him. By considering the teaching of Patel *et al.* regarding the use of carotenes, particularly the use of lycopene and lutein, and Fukamachi *et al.* regarding the use of carotenoids such as lutein and zeaxanthin would lead one skilled in the art to have a reasonable expectation of success in combining Patel *et al.* with Fukamachi *et al.* to obtain a bioavailable freeze-dried cyclodextrin/ carotenoid complex formulated with vegetable oil and lycopene, lutein or zeaxanthin.

Patel *et al.* provides the motivation to produce a "bioavailable carotenoid-cyclodextrin formulation for soft-gels and other encapsulation systems" that make use of hydrophobic ingredients such as lycopene, lutein or zeaxanthin because formulations containing these pharmaceutical active ingredients present a challenge in drug delivery(see US 6,569,463 abstract).

5. Claim 9 is directed to a formulation depending from claim 1 (as considered above) wherein the formulation is disposed in soft gelatin capsules.

The teachings of Leuenberger *et al.* and Fukamachi *et al.* are discussed above. Leuenberger *et al.* and Fukamachi *et al.* do not teach that the formulation

should be disposed of in soft gelatin capsules. However, Patel *et al.* teach that the resulting final formulation can be disposed of in soft gelatin capsules (see column 33 lines 53-54).

Therefore, it would have been obvious to one having ordinary skill in this art at the time the invention was made to prepare a formulation of a freeze-dried bioavailable cyclodextrin/carotenoid complex and vegetable oil and disposing the final formulation in a soft gelatin capsule having the above cited references before him. By considering the teaching of Leuenberger *et al.* and Fukamachi *et al.* above as well as the teaching of Patel *et al.* regarding the use of soft gelatin capsules would lead one skilled in the art to have a reasonable expectation of success in combining teachings of Leuenberger *et al.* and Fukamachi *et al.* with Patel *et al.* to obtain a pharmaceutically acceptable formulation incorporated into a soft gelatin capsules.

Patel *et al.* provides the motivation to produce a "bioavailable carotenoid-cyclodextrin formulation for soft-gels and other encapsulation systems" because formulations utilizing hydrophobic pharmaceutical active ingredients incorporated into soft gelatin capsules can be used for improved delivery of pharmaceutical active ingredients (see US 6,569,463 abstract).

B. Claims 11-20, are rejected under 35 U.S.C. § 103(a) as being unpatentable over Leuenberger *et al.* (US 5,221,735), Fukamachi *et al.* (US 4,929,774), Patel *et al.* (US 6,569,463) and Orthoefer (US 4,125,630).

1. Claims 11, 12 and 13 are directed to a method of making a bioavailable formulation consisting of a freeze-dried cyclodextrin/carotenoid complex, blended in vegetable oil wherein the formulation is then incorporated into soft gelatin capsules. The formulation also directs that the vegetable oil be edible and consist of one or more of coconut oil, corn oil, cottonseed oil, oat oil, olive oil, palm oil, palm kernel oil, peanut oil, rapeseed oil, rice bran oil, safflower oil, sesame seed oil, soybean oil, or sunflower oil.

Leuenberger *et al.* teach a bioavailable (see column 1 lines 5-18) spray-dried (see column 3 lines 43-44 through column 4 lines 1-3) cyclodextrin/ carotenoid complex (see column 1 lines 5-18 and lines 44-48) that is ground in oil resulting in a suspension (see column 1 lines 18-32). Leuenberger *et al.* does not teach freeze-drying of the cyclodextrin/carotenoid complex, the use of another carotenoid other than lycopene and apocarotenol in creating a formulation. Nor does Leuenberger *et al.* teach the use of a specific type of oil or the use of an edible oil much less the use of one or more of coconut oil, corn oil, cottonseed oil, oat oil, olive oil, palm oil, palm kernel oil, peanut oil, rapeseed oil, rice bran oil, safflower oil, sesame seed oil, soybean oil, or sunflower oil. Leuenberger *et al.* also does not teach that the formulation should be incorporated into soft gelatin capsules. Fukamachi *et al.* does teach a technique of freeze-drying of formulations (see column 3 lines 26-31) and the use of lutein and zeaxanthin in formulations (see column 3 line 57). Fukamachi *et al.* also teaches the use of edible vegetable oils such as olive oil, soybean oil, corn oil, cottonseed oil,

sunflower oil, peanut oil, palm oil, and coconut oil (see column 2 lines 11-20) and Orthoefer teaches edible triglyceride vegetable oils such as cottonseed oil, soybean oil, coconut oil, rapeseed oil, peanut oil, olive oil, palm oil, palm kernel oil, sunflower seed oil, rice bran oil, corn oil, sesame seed oil, safflower oil and the like (see column 4 lines 37-49). Patel *et al.* does teach that the formulation can be incorporated into soft gelatin capsules (see column 33 lines 53-55).

Therefore, it would have been obvious to one having ordinary skill in this art at the time the invention was made to prepare a formulation of a bioavailable freeze-dried cyclodextrin/carotenoid complex blended in vegetable oil wherein the formulation is then incorporated into soft gelatin capsules. Where the formulation also directs that the vegetable oil be edible and consist of one or more of coconut oil, corn oil, cottonseed oil, oat oil, olive oil, palm oil, palm kernel oil, peanut oil, rapeseed oil, rice bran oil, safflower oil, sesame seed oil, soybean oil, or sunflower oil having the above cited references before him. By considering all the prior art cited, it would lead one skilled in the art to have a reasonable expectation of success in combining Leuenberger *et al.* with Fukamachi *et al.*, Orthoefer and Patel *et al.* to obtain a bioavailable freeze-dried cyclodextrin/ carotenoid complex blended with a vegetable oil.

Leuenberger *et al.* provides the motivation to produce a "bioavailable carotenoid-cyclodextrin formulation for soft-gels and other encapsulation systems" because carotenoids are generally insoluble in polar solvents such as water. And when carotenoids are complexed with cyclodextrin this allows for

solubility in polar solvents and increased bioavailability (see US 5,221,735 column 1 lines 6-17).

2. Claim 14 is directed to a formulation depending from claim 11 (as considered above) wherein the weight-to-weight ratio of lecithin to vegetable oil is 10:1 to 1:1.

The teachings of Leuenberger *et al.* and Fukamachi *et al.* are discussed above. Leuenberger *et al.* and Fukamachi *et al.* do not teach a formulation using a surfactant. Patel *et al.* does teach the use of a surfactant such as lecithin (see claims 1, 11 and 12).

Therefore, it would have been obvious to one having ordinary skill in this art at the time the invention was made to prepare a formulation of a freeze-dried bioavailable cyclodextrin/carotenoid complex blended in vegetable oil with lecithin in a lecithin to vegetable oil range from 10:1 to 1:1 wherein the formulation is then incorporated into soft gelatin capsules having the above cited references before him. By considering the teaching of Leuenberger *et al.* and Fukamachi *et al.* above as well as the teaching of Patel *et al.* regarding the use of and effective solubilizing amount of lecithin would lead one skilled in the art to have a reasonable expectation of success in combining Leuenberger *et al.* with Fukamachi *et al.* and Patel *et al.* to obtain a bioavailable freeze-dried cyclodextrin/carotenoid complex formulated with lecithin to inhibit the release of active ingredients or modulate the dissolution properties of the formulation.

Patel *et al.* provides the motivation to produce a "bioavailable carotenoid-cyclodextrin formulation for soft-gels and other encapsulation systems" that makes use of lecithin because formulations utilizing such materials can be used for improved delivery of pharmaceutical active ingredients (see US 6,569,463 abstract).

3. Claims 15, 17, 18 and 20 are directed to a formulation depending from claim 11 (as considered above) wherein the cyclodextrin derivatives consists of α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin or hydroxypropyl-β-cyclodextrin; the carotenoid consists of lycopene, lutein, or zeaxanthin; the lecithin to vegetable oil ratio of the formulation is between 10:1 and 1:1 and the resulting final formulation is made for human ingestion.

The teachings of Leuenberger *et al.* and Fukamachi *et al.* are discussed above. Patel *et al.* teach the use of cyclodextrin derivatives (see column 29 lines 29-30); the use of carotenes (see column 5 lines 15, column 6 line 37, column 53 line 24, column 54 line 6, column 58 lines 3 and 53 and column 59 line 27) particularly the use of lycopene and lutein (see column 5 lines 32-33, column 6 line 50, column 53 lines 42-43 column 54 lines 22 and 62, column 58 lines 21-22 and column 59 lines 1 and 40); the lecithin to vegetable oil ratios as considered above and the resulting final formulation disposed of in soft gelatin capsules (see column 33 lines 53-54). Patel *et al.* also teaches that the formulation is for human administration (see column 43 lines 62-63, claim 27 and claim 53). Patel *et al.*

does not teach the specific use of α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin or hydroxypropyl-β-cyclodextrin or the use of zeaxanthin. Leuenberger *et al.*, however, does teach the use of α-cyclodextrin, β-cyclodextrin or hydroxypropyl-β-cyclodextrin (see column 2 lines 7-16). In addition, Fukamachi *et al.* teach the use of carotenoids such as lutein and zeaxanthin (see column 3 lines 56-57).

Therefore, it would have been obvious to one having ordinary skill in this art at the time the invention was made to prepare a formulation depending from claim 1 wherein the cyclodextrin derivatives consists of α-cyclodextrin, β-cyclodextrin, γ-cyclodextrin or hydroxypropyl-β-cyclodextrin; the carotenoid consists of lycopene, lutein, or zeaxanthin; the lecithin to vegetable oil ratio of the formulation is between 10:1 and 1:1 and the resulting final formulation is disposed in soft gelatin capsules and for human ingestion having the above cited references before him. By considering all the prior art cited, it would lead one skilled in the art to have a reasonable expectation of success in combining Patel *et al.* with Leuenberger *et al.* or Fukamachi *et al.* to obtain a bioavailable freeze-dried cyclodextrin/ carotenoid complex formulated with lecithin to be disposed of within soft gelatin capsules for human ingestion.

Patel *et al.* provides the motivation to produce a "bioavailable carotenoid-cyclodextrin formulation for soft-gels and other encapsulation systems" because formulations utilizing such materials can be used for improved delivery of pharmaceutical active ingredients that have hydrophilic or hydrophobic properties (see US 6,569,463 abstract).

4. Claim 16 is directed to a formulation depending from claim 11 (as considered above) wherein the carotenoid consists of lycopene, lutein, or zeaxanthin.

The teachings of Leuenberger *et al.* and Fukamachi *et al.* are discussed above. Patel *et al.* teach the use of carotenes (see column 5 lines 15, column 6 line 37, column 53 line 24, column 54 line 6, column 58 lines 3 and 53 and column 59 line 27) particularly the use of lycopene and lutein (see column 5 lines 32-33, column 6 line 50, column 53 lines 42-43 column 54 lines 22 and 62, column 58 lines 21-22 and column 59 lines 1 and 40). Patel *et al.* does not teach the use of zeaxanthin. However, Fukamachi *et al.* teach the use of carotenoids such as lutein and zeaxanthin (see column 3 lines 56-57).

Therefore, it would have been obvious to one having ordinary skill in this art at the time the invention was made to prepare a formulation containing carotenoids consisting of lycopene, lutein, or zeaxanthin having the above-cited references before him. By considering the teaching of Patel *et al.* regarding the use of carotenes, particularly the use of lycopene and lutein, and Fukamachi *et al.* regarding the use of carotenoids such as lutein and zeaxanthin would lead one skilled in the art to have a reasonable expectation of success in combining Patel *et al.* with Fukamachi *et al.* to obtain a bioavailable freeze-dried cyclodextrin/ carotenoid complex formulated with vegetable oil and lycopene, lutein or zeaxanthin.

Patel *et al.* provides the motivation to produce a "bioavailable carotenoid-cyclodextrin formulation for soft-gels and other encapsulation systems" that make use of hydrophobic ingredients such as lycopene, lutein or zeaxanthin because formulations containing these pharmaceutical active ingredients present a challenge in drug delivery(see US 6,569,463 abstract).

5. Claim 19 is directed to a formulation depending from claim 11 (as considered above) wherein the formulation is for human ingestion.

The teachings of Leuenberger *et al.* and Fukamachi *et al.* are discussed above. Leuenberger *et al.* and Fukamachi *et al.* do not teach that the formulation is for human ingestion. However, Patel *et al.* teach that the resulting final formulation is for human ingestion (see column 43 lines 62-63, claim 27 and claim 53).

Therefore, it would have been obvious to one having ordinary skill in this art at the time the invention was made to prepare a formulation of a freeze-dried bioavailable cyclodextrin/carotenoid complex blended in vegetable oil wherein the formulation is then incorporated into soft gelatin capsules for human ingestion having the above cited references before him. By considering the teachings of Leuenberger *et al.* and Fukamachi *et al.* above as well as the teaching of Patel *et al.* regarding the final formulation being for human ingestion would lead one skilled in the art to have a reasonable expectation of success in combining

teachings of Leuenberger *et al.* and Fukamachi *et al.* with Patel *et al.* to obtain a pharmaceutically acceptable formulation for human ingestion.

Patel *et al.* provides the motivation to produce a "bioavailable carotenoid-cyclodextrin formulation for soft-gels and other encapsulation systems" because formulations utilizing hydrophobic pharmaceutical active ingredients present delivery challenges due to their physiochemical properties (see US 6,569,463 abstract).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew L. Fedowitz whose telephone number is (571) 272-3105. The examiner can normally be reached on 9am-5:30pm (EST) M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. James O. Wilson can be reached on (571) 272-0661. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew L. Fedowitz, Pharm.D., Esq.
October 6, 2004

James O. Wilson
Supervisory Patent Examiner
Art Unit 1623